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10/527,986	03/21/2005	Juha Ylitalo	060091.00375	4859

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EXAMINER	
DOAN, PHUOC HUU	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/527,986	YLITALO, JUHA	
	Examiner	Art Unit	
	PHUOC H. DOAN	2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 April 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-63* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20,22-39,41-58 and 60-63* is/are rejected.

7)☒ Claim(s) *21,40 and 59* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 04/24/2007 have been fully considered but they are not persuasive.

The Examiner make a note: that the Applicant was not response or change claim(s) 3, 25-41, 43-47, and 39-62 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement, because the language has been used "**with previously known**" to make its different with claim 2. Also, claim 3 originally depended from claim 2. Claim 1 has been amended with limitations "weighting signals of the functional antenna branches **with previously known** weights that compensate for the primary weights to form a compensating radiation pattern" are different the meaning in term of functional antenna branches with claim 2, and 3.

The Applicant missed a point in the specification (pages 15, lines 4-8) states "the compensating radiation pattern 700 is formed by weighting signals of functional antenna branches 310A, 310B by previously known weights. The previously known weights may be stored in the memory of the control unit 210 or in the memory of the radio network.." are different the meaning or

function of "**weighting signals of the functional antenna branches with previously known weights that compensate for the primary weights to form a compensating radiation pattern**".

Claim 25, the Applicant used the language "a base station **configured** to form a radio interface" is different the meaning of "forming a radio interface of the radio system". The term "configured" is specific such as the software application on the base station (controller) to configure to control a radio interface system. The term "forming" is meaning that the branches such as 310A, 310B need to be disconnected when the base station transmits using the compensating radiation pattern 700 (See specification page 15, 16, and 18). Also, claims 26-41, 43-47, and 49-62 are using the same term "configured" as explain the same as above.

In response on the remarks pages 25-41, the Applicant is required to consider the references have been provide as clearly indicated every limitation on Office Action that mailed out 01/24/2007. The Examiner is not misunderstanding of Applicant's argument. The Examiner consider and look forward the claims limitation is clearly and more specific from specification to make the claims invention in fulfill and enabling of the claims rather take

piece by piece (language) amend to the claim(s) without senses, and meaning.

Consider the references of Nishimori, Weiss.

Nishimori disclose a feature of Adaptive array antenna system applied for forming a primary radiation pattern by weighting signals of at least two functional antenna branches of a base station, and forming a radiation pattern that compensates for the primary radiation pattern by weighting signals.

Weiss disclose a feature of an antenna array for particular of beams and efficient beam combination to applied the inputs of antenna for beams.

These limitations based on the function of weighting signal used by antenna branches, and disconnected one antenna branch to forming a radiation by compensates process signal.

Nishimori clearly discloses forming a primary radiation pattern by weighting signals of at least two functional antenna branches "col. 6, lines 62-67, a calibration value is calculated between two adjacent branches" of a base station "col. 1, lines 22-23, antenna used for the communication between mobile device and base station"(See col. 1, lines 54-65); and forming a radiation pattern which compensates for the primary radiation pattern by

weighting signals "col. 14, lines 28-51, weight multiplier circuit" of the functional antenna branches (col. 9, lines 32-51, an amplitude/phase calibration value calculation circuit, 2-10 is a radiation pattern control calculation circuit, and 2-11 is a weight multiplier circuit).

Weiss in combining with Nishimori, Weiss specifically discloses that disconnecting at least one antenna branch (col. 5, lines 15-27, the inputs of antenna for beams are left disconnected since these outermost beams would be attenuated).

Nishimori more specifically disclose **the calibration** on transceiver to prevent during actual communication error by affected amplitude error, phase error, and the change of the temperature characteristics during communication **can be compensated of a radiation pattern** (col. 15 through col. 16, lines 39-7). Nishimori clearly discloses a plurality antenna element used by block functional circuit such as weight multiplier circuit; amplitude/phase calibration calculation circuit; and radiation pattern control calculation circuit which generation the calibration system to compensation of a radiation (Fig. 2, 6 with description).

In combining Nishimori and Weiss, in the same filed of invention, Weiss discloses an antenna array "multi element antenna arrays on the base stations

that provided an input signal for generating output the desired radiation pattern to prevent the interruption cased by interference. Weiss specifically disclose one input (one antenna branch) are disconnected by multi element antenna array (Please see detail in col. 4 through col. 5, lines 13-62) and applicant's specification on page 14.

The Examiner consider the references to applied the rejection based on the feature of functional and operational of the antenna branches have forming and used compensation of radiation pattern (signal) by (weight signal which is well known technique) in a radio system to prevent the interrupted the operation in base station. See detail in Office Action, and the Examiner will consider the claim(s) in fully amend with specific detail from specification to claims in term of function and operational in fulfill and enabling.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims **1-63** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Nishimori (US Patent No: 6,735,182)** in view of Weiss **(US Patent No: 5,784,031)**.

As to claim 1, 2-3, 32, 51-52, and **63,** Nishimori discloses a method of compensating for a radiation pattern in a radio system (See Abstract), the method comprising: forming a primary radiation pattern by weighting signals of at least two functional antenna branches "col. 6, lines 62-67, a calibration value is

calculated between two adjacent branches" of a base station "col. 1, lines 22-23, antenna used for the communication between mobile device and base station"(See col. 1, lines 54-65); and forming a radiation pattern that compensates for the primary radiation pattern by weighting signals "col. 14, lines 28-51, weight multiplier circuit" of the functional antenna branches (col. 9, lines 32-51, an amplitude/phase calibration value calculation circuit, 2-10 is a radiation pattern control calculation circuit, and 2-11 is a weight multiplier circuit). However, Nishimori does not specifically disclose that disconnecting at least one antenna branch based on a command indicating a fault in an antenna element, antenna feeding cable, or power amplifier.

In the same field of invention, Weiss specifically discloses that disconnecting at least one antenna branch based on a command indicating a fault in an antenna element, antenna feeding cable, or power amplifier (col. 5, lines 15-27, the inputs of antenna for beams are left disconnected since these outermost beams would be attenuated). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the disconnecting at least one antenna branch as taught by Weiss to the system of Nishimori in order to avoid significant field cancellation.

As to claim 12, Nishimori further discloses that further comprising weighting signals of the functional antenna branches with previously known weights (Fig. 2, item 2-11, col. 10, lines 39-41).

As to claim 4, 13, Nishimori further discloses that further comprising weighting signals of the functional antenna branches with weights that differ from the primary weights (col. 10, lines 45-51).

As to claim 5, 26, 45, Nishimori further discloses wherein the primary radiation pattern is fixed and the compensating radiation pattern is fixed (col. Fig. 1, item 1-7 "**radiation pattern control calculation circuit**").

As to claim 6, Weiss further discloses wherein the primary radiation pattern is the radiation pattern used in transmission (col. 3, lines 45-50), the disconnected antenna branch is the transmitting antenna branch (col. 5, lines 15-27), and the compensating radiation pattern is the radiation pattern used in transmission (col. 3, lines 55-65).

As to claim 7-9, Weiss further discloses all the limitations in col. 5, lines 15-27, and col. 7, lines 45-52 "**Fig. 6A depicts the radiation pattern for a beam b7 in a 16 beam system wherein uniform weights are assigned to each antenna element 208**".

As to claim 10, 30, 49, Weiss further discloses that further comprising forming the radiation pattern that compensates for the primary radiation pattern by weighting signals of the functional antenna branches so that compensation occurs in the azimuth direction (Fig. 5, 8A; col. 7, lines 45-52 **"Azimuth direction"**).

As to claim 11, 31, 50, Weiss further discloses a method that further comprising forming the radiation pattern compensating for the primary radiation pattern by weighting signals of the functional antenna branches so that compensation occurs in the elevation direction (col. 5, lines 56-65 "**elevation direction** associated the radiation is measured at a distance which is much larger than the array dimension").

As to claim 14, 33, 52, Nishimori further discloses that further comprising forming the compensating radiation pattern by weighting signals of the functional antenna branches **digitally** (col. 1, lines 55-65 **"weight multiplier circuit calculated with digital so that a desired shape of an antenna beam is obtained"**, col. 2, lines 54-60).

As to claim 15, 34, 53, Nishimori further discloses that further comprising forming the compensating radiation pattern by weighting signals of the functional antenna branches with weights that are based on the configuration of the functional antenna elements in the antenna array (col. 5, lines 60-65).

As to claim 16, 35, 54, Nishimori further discloses by further comprising forming the compensating radiation pattern by weighting signals of the functional antenna branches with weights that are based on the radiation patterns formed by single antenna elements (col. 7, lines 63-66).

As to claim 17, 36, 55, Nishimori further discloses by further comprising forming the compensating radiation pattern by weighting signals of the functional antenna branches with weights that are based on the weighting function of the aperture of the antenna array (col. 5, lines 53-67).

As to claim 18, 56, the combination of Nishimori and Weiss further discloses by further comprising forming the compensating radiation pattern by weighting signals of the functional antenna branches so that the main beams of the compensating radiation pattern overlap at least partly with the main beams of the primary radiation pattern (col. 4, lines 29-50, and Fig. 8A, col. 7, lines 53-60 "radiation pattern for beams, beams B7 and beam B8 overlap" of Weiss).

As to claim 19, 38, 57, Weiss further discloses by further comprising forming the compensating radiation pattern by weighting signals of the functional antenna branches so that at least one main beam of the primary radiation pattern is compensated with at least one main beam of the compensating radiation pattern (col. 4, lines 29-67).

As to claim 20, 39, 58, Nishimori further discloses the compensating radiation pattern by further comprising forming weighting signals of the functional antenna branches so that at least one main beam of the primary radiation pattern is compensated with one main beam of the compensating radiation pattern and coding of the signals of the compensating main beam is the same as the **coding of the signals "Fig. 1, item 1-6 "amplitude/phase calibration value calculation circuit, Fig. 2, item 2-11"weight multiplier circuit used DSP and software for encoding and decoding signals before antenna receiver/transmit**" of the main beam to be compensated for (col. 2, lines 40-63, col. 3, lines 50-64).

As to claim 22, 41, 60, Weiss further discloses by further comprising forming the compensating antenna beam structure by weighting signals of the functional antenna branches so that the dynamic range of the main beams of the compensating radiation pattern is optimized (col. 7 through col. 8, lines 45-23).

As to claim 23, 61, Weiss further discloses by further comprising: A method according to claim 1, calibrating the functional antenna branches after the compensating radiation pattern has been formed (col. 8, lines 4-23).

As to claim 24, 62, Weiss further discloses by further comprising forming a command for disconnecting at least one antenna branch (col. 5, lines 20-25); and

disconnecting said at least one antenna branch on the basis of the command formed (col. 5, lines 15-32).

As to claim 25, 27-29, 43, 44, 46-48, Nishimori discloses a radio system comprising (See Abstract): **a base station "col. 1, lines 22-23, antenna used for the communication between mobile device and base station"** for forming a radio interface of the radio system (col. 2, lines 40-53) the base station comprises at least two antenna branches (col. 1, lines 49-53), for establishing a radio link to terminals (col. 1, lines 20-27); each antenna branch (col. 6, lines 60-67), comprises at least one antenna element (Fig. 1) for forming an antenna array (col. 5, lines 53-65); and the base station comprises weighting means for **weighting signals "col. 14, lines 28-51, weight multiplier circuit"** of the functional antenna branches (col. 9, lines 32-51 "an amplitude/phase calibration value calculation circuit") , for forming a primary radiation pattern wherein the base station is arranged to disconnect at least one antenna branch (col. 9, lines 32-51, **an amplitude/phase calibration value calculation circuit, 2-10 is a radiation pattern control calculation circuit, and 2-11 is a weight multiplier circuit)**; and wherein the weighting means are arranged to weight signals of the functional antenna branches to form a radiation pattern which compensates for the primary radiation pattern (col. 5, lines 8-52 **"an array antenna system with including a radiation pattern**

control calculation circuit 6-10 for controlling radiation pattern of adaptive array antenna system by weighting amplitude and phase of a signal applied to each receivers"). However, Nishimori does not specifically disclose that disconnecting at least one antenna branch.

In the same field of invention, Weiss specifically discloses that disconnecting at least one antenna branch **(col. 5, lines 15-27, the inputs of antenna for beams are left disconnected since these outermost beams would be attenuated)**. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the disconnecting at least one antenna branch as taught by Weiss to the system of Nishimori in order to avoid significant field cancellation.

As to claim 37, the combination Nishimori and Weiss further discloses wherein the weighting means are arranged to weight signals of the functional antenna branches (col. 10, lines 39-49 of Nishimori) , so that the main beams of the compensating radiation pattern overlap at least partly with the main beams of the primary radiation pattern (Fig. 8A, col. 7, lines 53-60 "radiation pattern for beams, beams B7 and beam B8 overlap" of Weiss) .

As to claim 42, Nishimori further discloses wherein the base station comprises means for calibrating the antenna branches (col. 2, lines 16-30 "amplitude and

phase in each branches in an array antenna should be adjusted, when transmit radiation pattern should coincide with receive radiation pattern").

Allowable Subject Matter

4. Claims **21, 40, 59** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

As to claim 21, 40, 59, the prior art of the record does not disclose comprising forming the compensating radiation pattern by weighting signals of the functional antenna branches so that at least one main beam of the primary radiation pattern is compensated with one main beam of the compensating radiation pattern and the identification signal of the compensating main beam is the same as the **identification signal** of the main beam to be compensated for.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.**

See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PHUOC H. DOAN whose telephone number is 571-272-7920. The examiner can normally be reached on 9:30 AM - 6:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, JOSEPH FEILD can be reached on 571-272-4090. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Phuoc Doan
07/04/07

JOSEPH FEILD
SUPERVISORY PATENT EXAMINER